

QUARTERLY SUMMARY  
OF THE  
IMPROVEMENTS AND DISCOVERIES  
IN THE  
MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *Structure of the Nervous Tissue.*—Dr. ROUDANOVSKY makes his sections of the nervous substance, when frozen, with a double-edged knife; colours them with a watery solution of cochineal, and then covers them with Canada balsam. He says that, in transverse section, the primitive elements of the nerves are pentagonal or hexagonal tubes. Their walls of connective-tissue appear as a network, leaving, in some places, between the tubes themselves and between the bundles of tubes star-shaped closed cavities (reservoirs), by which the nutrition of the nervous elements is effected. The isolation of nerve-tubes is an artificial phenomenon. The cylinder axes, as well as the walls of the tubes, are coloured by cochineal. The cylinder axes are seen in the centre of the tubes as knotty fibres. The cylinder axes give off transverse fibres, which pass through the walls and communicate with similar fibres of other cylinders. In the length of a cylinder axis the transverse fibres of a section of the cylinder axis are given off at nearly equal distances. The transverse fibres are found in the anterior and posterior roots of the spinal nerves, but, perhaps, they are wanting in some nerves. The cylinder axes are surrounded in the nerve tubes by the white substance, which is hardly ever coloured by cochineal, and which in Canada balsam preparations always appears as an amorphous granular mass. In the composition of a bundle of tubes enter large, and fine, and finest tubes. Of the fine and finest tubes the number varies in the different nerves and in their different bundles. They are found particularly in the posterior roots of the spinal nerves, and have the same structure as the large tubes with their cylinder axis. The fine and finest tubes very probably belong to the brain, where they are the predominating, if not exclusive, elements of the white substance. Every nerve contains at once an anatomical substratum of the brain, of the spinal cord, and probably of the ganglions.

In fine sections the gray substance always appears diaphanous, and of a yellowish-gray colour, due particularly to the absence of myeline, giving a dull appearance to the white substance, of opacity. In preparations made with gelatine the myeline appears as fat drops, or sometimes as granular drops. The gray substance of the central organs is composed of cells and nerve fibres like their prolongations or branchings; the white substance of tubes with the characters of those in the nerves. The nerve cells should, without doubt, be considered as the origin of the nerves. They differ in size and shape, in having or not having prolongations, and in the number of the latter. In some parts of the central organs the nerve cells unite by some of their prolongations, thus forming a mesh, at the angles of which are the nerve cells themselves, and thus forming the network of nerve cells. In many parts of the central organs, the

tissue of the gray substance shows meshes formed exclusively of nerve fibres, forming a network of the fibres. On the surface of the optic thalami, these bundles of fibres bend in opposite directions, forming a special arrangement of the meshes, as a network of the knots. Meshes or network of gray substance are an essential characteristic of the central parts, as much as a differing direction of the bundles of the fibres of the gray substance, and of the bundles of the nerve tubes of the white substance. From this it follows, that some of the nerve fibres of the gray substance curve or bend in the white substance in which they appear as the cylinder axis in the tubes of this substance. In nearly all the spinal cord, the general law of the structure of the central organs is observed, the fibres of the gray substance being in opposite direction to that of the tubes of the white substance. The nerve cells communicate by some of their prolongations in the group in which they are found, whether in the posterior or the anterior cornua. Some of the branches of the nerve cells, passing transversely to the axis of the spinal cord, bend inwards and become parallel to this axis, and go to form cylinder axes in the tubes of white substance. There are nerves which leave the central parts of the brain and spinal cord, as tubes, and others that are not so.

In cats, dogs, and rabbits the alterations produced by poisoning by nicotine were indicated by the extreme pigmentation and destruction of the nerve cells, and their prolongations only in the spinal cord where the vagus and hypoglossal nerves arise. The reservoirs also increase in size. Death is effected not only by chemically altering the metamorphosis of the whole organism, but by destroying the little organs such as the nerve cells, which are the origin of the nerves of the chief organs of life. Opium and chloroform act on the myeline, which instead of assuming the granular amorphous form has the appearance of little brilliant bodies.—*Brit. and For. Medico-Chir. Review*, April, 1865, from *Gazette Medicale de Paris*, December 24th, 1864.

*2. On the Rapidity of the Passage of Crystallloid Substances into the Vascular and Non-Vascular Textures of the Body.*—Dr. HENRY BENCE JONES has communicated to the Royal Society the following results of some observations lately made by him on this subject:—

“It occurred to me that it might be possible to trace the passage of substances from the blood into the textures of the body by means of the spectrum-analysis, and with the assistance of Dr. Dupré some very remarkable results have been obtained.

“Guinea-pigs have chiefly been used for the experiments. Usually no lithium can be found in any part of their bodies. When half a grain of chloride of lithium was given to a guinea-pig for three successive days, lithium appeared in every tissue of the body. Even in the non-vascular textures, as the cartilages, the cornea, the crystalline lens, lithium could be found.

“Two animals of the same size and age were taken; one was given three grains of chloride of lithium, and it was killed in eight hours; another had no lithium; it was also killed, and when the whole lens was burnt at once no trace of lithium could be found. In the other, which had taken lithium, a piece of the lens  $\frac{1}{6}$ th of a pin's head in size, showed the lithium; it had penetrated to the centre of the lens.

“In another pig the same quantity of chloride of lithium was given, and in four hours even the centre of the lens contained lithium.

“Another pig was given the same quantity, and it was killed in two hours and a quarter. The cartilage of the hip showed lithium faintly, but distinctly. The outer portions of the lens showed it slightly; the inner portions showed no trace.

“To a younger pig the same quantity was given, and it was killed in thirty-two minutes. Lithium was found in the cartilage of the hip; in the aqueous humour; distinctly in the outer part of the lens, and very faintly in the inner part.

“In an older and larger pig, to which the same quantity was given, lithium after one hour was found in the hip and knee-joints very faintly; in the aqueous humour of the eye very distinctly; but none was found in the lens, not even when half was taken for one trial.